



# **D**Tigress **DROPS**

The revolutionary **DR**illing **OP**timisation Simulator from Drops Technology, as described in International Association of Drilling Contractors/Society of Petroleum Engineers paper IADC/SPE 77247 and used by Norsk Hydro, is now available as an integrated add-on to the Tigress suite of E&P applications.

## What is DROPS?

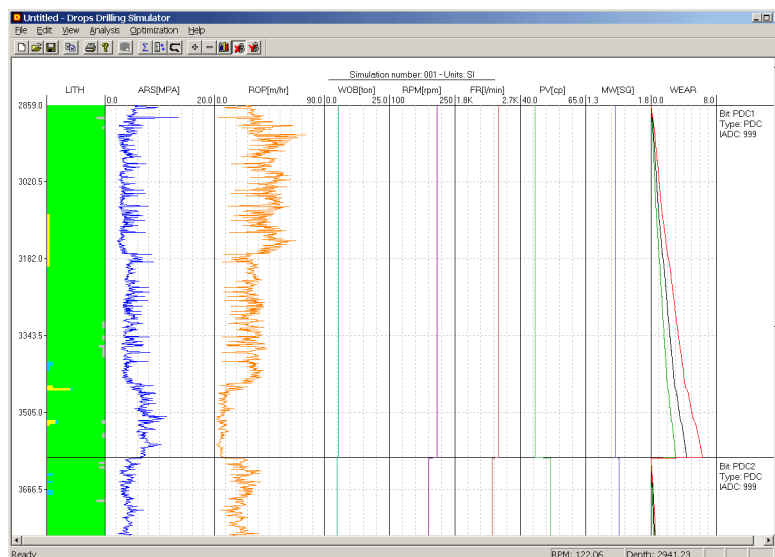
The DROPS concept is simple, yet unique in the oil industry. You enter existing drilling data from an area into DROPS, which then uses sophisticated Rate-Of-Penetration models to create an **apparent rock strength log (ARSL)** for the stratigraphic sequence in that area. The trace is an accurate, meter-by-meter calculation of rock strength. DROPS then uses the ARSL trace as a basis for simulating the drilling process for any ongoing or future wells in the same area. By modelling various combinations of input parameters you can predict and optimise drilling progress – both time and cost – before you drill.

Input parameters include:

- Operating conditions – hydraulics, mud weight, pore pressure changes
- Bit change, bit design
- Pull depths
- Casing
- Weight On Bit
- RPM

With DROPS you can:

- Compare drill bit performance in the simulator and choose the most appropriate bit combination for your stratigraphy.
- Compare bit designs against specific rock formations before you drill into them.
- Predict bit wear. DROPS tells you whether the slow going is due to hard formation or a worn out bit that needs to be replaced.
- Use real-time bit and formation evaluation to refine your drilling model for accuracy. Compare the revised rock strength log with that from the reference well.
- Generate revised best-continuation drilling programs after unforeseen events.
- Use the apparent rock strength log in other studies, for creating well bore stability envelopes to help prevent hole collapse and stuck bits, and determine optimum casing depth.
- Optimise subsections or entire wells.
- Use for post-analysis to identify incorrect decisions – so they are not repeated next time.
- Transfer the drilling experience gained from one well to the next, building up a knowledge base for each stratigraphic area.
- Reduce your time-based drilling costs.
- Systematically evaluate drilling success.



## Quantify your decisions with DROPS

DROPS does for drillers what spreadsheets do for accountants. DROPS allows you to apply 'what if?' scenarios to your drilling plans and calculate the outcomes.

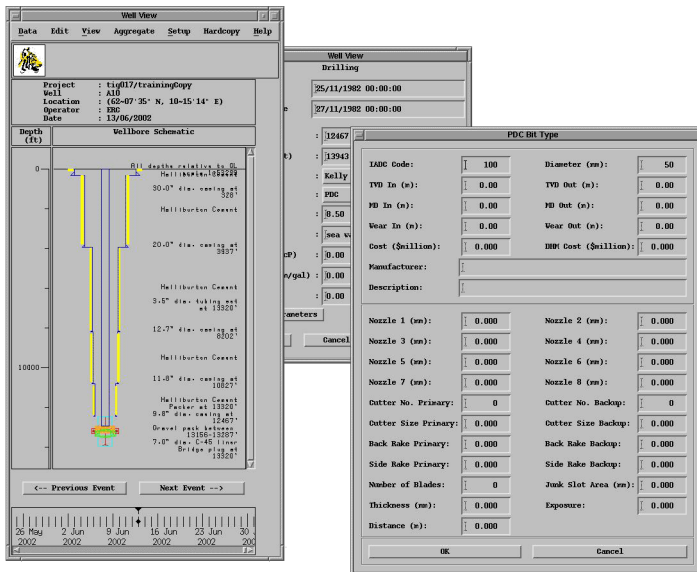
With DROPS you can replace highly speculative drilling guesswork with **quantifiable, justifiable decisions** that save you money. In the IADC/SPE 77247 paper, Norsk Hydro reported a typical cost savings of **10-25%** for DROPS managed wells compared to unsimulated reference wells.

Section	Run	BitID	From	To	Dir	WOB	PPM	Flows	PV	MW	BitWe	Total	RCP	Cost/m	Drills	Mud%	
001	001	000-PDC	2859.0	3600.0	0741.0	05.6	2101	24045	45.9	1.55	0.0	0.0	0.00	0.00	0.00	Rotary	Oil
002	002	001-PDC	3601.0	4215.0	0614.0	04.9	1902	23164	51.7	1.58	0.0	0.0	0.00	0.00	0.00	Rotary	Oil
003	003	002-TN	4216.0	4275.0	0059.0	18.9	1685	20819	55.0	1.63	0.0	0.0	0.00	0.00	0.00	Rotary	Oil
004	004	003-PDC	4276.0	4474.0	0198.0	09.0	1382	22138	54.4	1.62	0.0	0.0	0.00	0.00	0.00	Rotary	Oil

If you (or your manager) are uneasy with your arm-waving attempts to justify your drilling decisions, **quantify them with DROPS.**

## Integration with Tigriss

Although DROPS uses data files, new features in Tigriss allow you to import and export these files and edit the DROPS-related data within Tigriss, allowing you to use the Tigriss PDS database as the main repository for your DROPS data. You can:



- Use The Import/Export System (TIES) of the Tigriss PDS to import and export DROPS data files:
  - Import DROPS Simulation Results Ascii files
  - Import DROPS Apparent Rock Strength Logs (ARSL) and Geology Binary files
  - Export DROPS Bit Parameter Binary files
- View and edit bit data within the Tigriss PDS Well View application.
- View and edit the ARSL trace as you would any other trace, in the Tigriss Trace Edit, Log Plot, or Well Correlation & Zonation applications.
- View and edit well location data in the Tigriss Deviation Survey application.

The link to Tigriss means that you can now manage your DROPS projects with the comprehensive data handling facilities of Tigriss, from log import, export, view, and edit to data backup/restore and plotting.

*Integrated by Design*



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